

ABSTRACT

A cell free extract from a ciliate microorganism, including protozoo *Tetrahymena*, wherein the extract comprises a homogenate a microsomal fraction, a desaturase-enriched fraction or a mixture thereof and, more particularly the invention provides substantially pure enzymes: 7 cholesterol desaturases and 22 cholesterol desaturases. The invention also relates to methods for recovering cholesterol desaturases activities from ciliates, including *Tetrahymena*, and their use in a production of Vitamin D precursors and analogs from several cholesterol sources.